

## **Validating a scale measuring engagement in a South African context**

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### **Abstract**

Employee engagement is at the top of management agendas because it is associated with a range of benefits. A number of instruments are available to measure engagement. However, the validity of widely used instruments measuring engagement was found to be less than optimal. Consequently the authors set out to validate a scale measuring engagement concurrently at the individual and organisational levels in a diverse, multicultural (South African) context, reported here.

Study 1 collected survey data from employees, reflecting the profile of typical South African employees, in one company using a web-based questionnaire. Exploratory factor analysis (EFA) was used to determine the factorial structure and Cronbach's alpha was used to establish the internal reliability of the scale and its subscales. The internal reliability and construct validity were confirmed by means of confirmatory factor analysis (CFA) in study 2.

The statistical analyses showed that employee engagement, a distinct construct, consists of six factors representing the different hierarchical levels of the organisation. Originality/value of this paper includes that it is one of the first studies to validate a scale measuring engagement concurrently at the individual and organisational levels in a diverse, multi-cultural context, building on existing research, thus advancing understanding of the construct.

### **Key phrases**

*diverse multicultural context; employee engagement; individual level; organisational level; South Africa; validation of measurement instrument*

## 1. INTRODUCTION

Employee engagement, whether at the organisational or individual level, is at the centre of attention from both academics and practitioners. It is argued that engagement, whether at the individual or organisational level, brings with it a range of benefits including happier, productive employees, better customer service, a competitive advantage and, ultimately, enhanced organisational performance (Attridge 2009; Barnes & Collier 2013:485; Fearon, McLaughlin & Morris 2013:244; Gruman & Saks 2011; Harter, Schmidt & Hayes 2002:268; Jenkins & Delbridge 2013:2670; Jeung 2011:49; Kahn 1990; Klassen, Aldhafri, Mansfield, Purwanto, Siu, Wong & Woods-McConney 2012:318; Lewis 2011; Rich, LePine & Crawford 2010; Saks 2006; Schaufeli & Salanova 2008; Training & Development 2013; Truss, Shantz, Soane, Alfes & Delbridge 2013:2658; Van Rooy, Whitman, Hart & Caleo 2011:148; Xantopoulou, Bakker, Demerouti & Schaufeli 2009).

If one accepts this argument, it becomes important to know what an organisation can do in order to nurture such engagement. The literature on engagement, however, shows that authors are not entirely unanimous about this construct. Authors are in agreement on some aspects in connection with engagement, including that engagement is an emerging field (Truss *et al.* 2013; Van Rooy *et al.* 2011:150), a multi-dimensional, multi-level construct (Frese 2008; Guest 2014; Fearon *et al.* 2013:247; Gruman & Saks 2011; Harter *et al.* 2002; Kahn 1990; Lockwood 2007; Macey & Schneider 2008; Masson, Royal, Agnew & Fine 2008; May, Gilson & Harter 2004; Mills, Culbertson & Fullagar 2012; Parker & Griffin 2011; Robertson & Cooper 2010; Rich *et al.* 2010; Saks 2006, 2008; Schaufeli, Salanova, González-Romá & Bakker 2002; Schaufeli, Bakker & Salanova 2006; Seppälä, Mauno, Feldt, Hakanen, Kinnunen & Tolvanen 2009; Shuck & Reio 2011; Truss *et al.* 2013:2659; Van Rooy *et al.* 2011), making it complex (Lockwood 2007); and that tenets of engagement (partially) overlap with other employee-focussed constructs (CIPD 2012; Endres & Mancheno-Smoak 2008; Frese 2008; Guest 2014:148; Juniper 2012; Kahn 1990; Masson *et al.* 2008; Newman & Harrison 2008; Parker & Griffin 2011; Rich *et al.* 2010; Robertson & Cooper 2010; Saks 2006; Shuck & Reio 2011; Truss *et al.* 2013), which threatens discriminant validity (Saks 2008; Harter & Schmidt 2008; Newman & Harrison 2008), itself important in construct validity.

Some authors, however, question the validity and/or the usefulness of the construct (Bakker *et al.* 2011:8; Guest 2014). Areas of concern include

- whether the construct is a passing management fad or built on a sound theoretical and empirical base (Guest 2014:141; Saks 2006:612);
- the conceptualisation of the concept given the different definitions (Christian, Garza & Slaughter 2011; Endres & Mancheno-Smoak 2008; Guest 2014:150; Gruman & Saks 2011; Juniper 2012; Kahn 1990; Lewis 2011; Saks 2006; Truss *et al.* 2013);
- the exact dimensions and/or terminology to identify the dimensions of engagement (Dalal, Brummel, Wee & Thomas 2008; Frese 2008; Griffin, Parker & Neal 2008; Hirschfeld & Thomas 2008; Juniper 2012; Macey & Schneider 2008; Robertson & Cooper 2010; Saks 2008; Schaufeli & Salanova 2011);
- different explanations of the construct such as exchange or motivational theory/ies (Christian *et al.* 2011; Kahn 1990; Meyer & Gagné 2008; Salanova, Agut & Peiro 2005; Saks 2006; Soane *et al.* 2012:529-530; Rich *et al.* 2010; Sinickas 2010; Truss *et al.* 2013:2657-8);
- the seemingly separate existence of work and employee engagement (Fearon *et al.* 2013:251; Guest 2014:142; Pugh & Dietz 2008; Truss *et al.* 2013);
- while some authors warn that the focus on intrinsic outcomes to the exclusion of extrinsic outcomes may be unrealistic, and that the assumption of conscious thoughts, feelings and motivations as drivers of workplace behaviour should be included in the consideration of the role of non-conscious processes in initiating behaviour (George 2011:55-56);
- issues concerning the appropriate level of engagement and when engagement may become damaging to employees' health and work-life-balance (George 2011:54; Guest 2014:146,148; Truss *et al.* 2013);
- while contextual differences may matter (Bakker *et al.* 2011:9-10; DeVellis 2003; Egri 2013; Farh *et al.* 2006; Jenkins & Delbridge 2013; Jack *et al.* 2013; Johns 2006; Rousseau & Fried 2001; Truss *et al.* 2013; Whetten 2009) and
- the validity of widely used instruments measuring engagement was found to be less

than optimal (Klassen *et al.* 2012:334; Viljevac *et al.* 2012:3706).

Nevertheless, a number of measurement instruments are available to measure the construct from different perspectives (Attridge 2009; Bakker *et al.* 2008; Barnes & Collier 2013:485; Christian *et al.* 2011; Guest 2014:144; Jeung 2011; Masson *et al.* 2008; May *et al.* 2004; Rich *et al.* 2010; Schaufeli *et al.* 2002; Simpson 2009; Truss *et al.* 2013; Van Rooy *et al.* 2011:148-149).

Some authors raise issues in connection with these measurement instruments, and thus call for further research to clarify the current theories about engagement and to further develop – or at least refine – engagement measurement instruments (Bakker *et al.* 2011:23; Fearon *et al.* 2013:252; Frese 2008; Guest 2014:156; Klassen *et al.* 2012:333; Rothmann & Rothmann 2010; Saks 2006; Seppälä *et al.* 2009; Sonnentag 2011:35; Truss *et al.* 2013:2664-5; Van Rooy *et al.* 2011:150-151; Viljevac *et al.* 2012:3707).

A number of authors (Aguinis & Edwards 2014:144; Hinkin 1998; Masson *et al.* 2008) point out that, to be useful, a measurement instrument should be rigorous (reliable and valid) as well as relevant for the practice of management (Aguinis & Edwards 2014:144), with due regard to the fact that complex constructs, comprised of multi-level, multi-dimensions such as engagement, typically fail to report reliability estimates (Aguinis & Edwards 2014:148; Edwards 2001), which necessitates further research to contribute to clarity. Consequently, the authors heeded this call and validated a scale measuring employee engagement, concurrently at the individual and organisational levels, and adapted for a diverse, multicultural context (South Africa). This study addressed some of the concerns raised in connection with engagement research and contributes to the engagement literature in three ways.

First, it provides information about engagement at the individual and organisational level, bridging the micro-macro divide (Alfes *et al.* 2013; Fearon *et al.* 2013; Guest 2014).

Second, the conceptualisation of engagement uses a multi-faceted construct, which takes into account the fact that engagement can include different dimensions (Macey & Schneider 2008).

Third, the conceptualisation of engagement is adapted from existing research (see for example Macey & Schneider 2008; May *et al.* 2004; Saks 2006; Schaufeli *et al.* 2002) and also expands research to take into account context of research as proposed by various authors (see, for example, Egri 2013; Farh *et al.* 2006; Jack *et al.*, 2013; Johns 2006; Rousseau & Fried 2001; Truss *et al.* 2013; Whetten 2009). The purpose of this article is to report on the validation of a scale measuring employee engagement concurrently at the individual and organisational level, in a diverse, multi-cultural context (South Africa), following Hinkin (1998), focussing on steps 2 to 5 of the process of scale development.

## 2. A BRIEF OVERVIEW OF THE INSTRUMENT

Nienaber and Martins (2014) developed a scale, measuring employee engagement concurrently at the individual and organisational level, for a diverse, multicultural context (South Africa). The instrument development followed the process of scale development (step 1) proposed by Hinkin (1998). In addition, the authors observed the guidelines of Aguinis and Edwards (2014), DeVellis (2003) and Edwards (2001) in connection with measurement, while the context of measurement was attended to by considering the recommendations of Egri (2013), Farh *et al.* (2006), Jack *et al.* (2013), Johns (2006), Rousseau and Fried (2001), Truss *et al.* (2013) and Whetten (2009).

In essence, engagement was conceptualised at both the individual and organisational level(s), because it reflects the individual employee's work role and role as organisational member (Alfes *et al.* 2013; Fearon *et al.* 2013; Saks 2006). Moreover, it can be argued that individuals make up teams, and teams make up organisations, while person and environment influence each other (Bateman & Crant 1993; Robbins *et al.* 2003:15). Moreover, every position in an organisation is/was designed to accomplish the organisational goals through strategy, which to be effective, should be founded on competitive advantage (David 2012; Pearce & Robinson 2011).

Hence, in considering "engagement" the individual and organisational levels should not be separated. Consequently the most appropriate description/definition for purposes of the study was "employee engagement refers to 'engaged employees' at both the individual and organisational level, who are fully absorbed by and enthusiastic about their work, and so take positive action to further the organisation's reputation and interests".

Furthermore, the authors concurred with Saks (2006) that individual employees choose to engage themselves to varying degrees in response to the resources they receive from their organisation. Hence, engagement can be explained by both motivational and exchange theories. Explaining phenomena by integrating theories is not uncommon and can, in certain cases, even be desirable (Mayer & Sparrowe 2013).

The framework of Macey and Schneider (2008:6) was adapted to include the organisational level. Each of the components (e.g. trait engagement; state engagement; work; trust) of the Macey and Schneider (2008:6) framework comprise a number of "items" (for example organisational commitment; proactive personality), each of which has at least one existing measurement scale (see, for example, Allen & Meyer 1996; Bateman & Crant 1993).

The authors drew on the existing scales (see, for example, Allen & Meyer 1996; Bateman & Crant 1993; Benson & Brown 2007; Callow *et al.* 2009; Carless *et al.* 2000; Csikszentmihalyi 1975; Deci & Ryan 1985; Heneman & Schwab 1985; Iverson 1996; Kiggudu 1981; May *et al.* 2004; Oldham *et al.* 1986; Patterson *et al.* 2005; Porter *et al.* 1974; Price & Mueller 1981; Rich *et al.* 2010; Rizzio *et al.* 1970; Saks 2006; Schaufeli *et al.* 2002; Spreitzer 1995; Tetrick & LeRocco 1987; Watson *et al.* 1988), which have been part of prior research, including engagement, to generate items for the South African, diverse, multi-cultural, scale measuring employee engagement concurrently at the individual and organisational levels. The scale aimed to retain conceptually clear and parsimonious items, phrased in English, the business language of South Africa, for each of the levels of engagement.

The items included in the (South African) scale in question were discussed with various experts in the field of Industrial and Organisational Psychology and the field of Human Resources, after which items were (where needed) rephrased or added (or overlapping items were deleted), leaving a pool of 82 items (Nienaber & Martins 2014:493).

The instrument consisted of two sections, one collecting biographical/demographic information (gender, qualifications, experience and tenure) and one soliciting responses, using a five-point Likert scale, on statements about engagement at the individual level (50 statements, for example, "I feel positive about my work"), team/departmental level (12 statements such as "my team continuously strives to improve performance in line with our

business objectives”) and organisational level (10 statements such as “our top management communicates the vision and mission to us”). The validation of this instrument is described in the next section.

### **3. INSTRUMENT VALIDATION**

According to Hinkin (1998:106), instrument validation consists of following steps: administration of the instrument, initial item reduction, confirmatory factor analysis and convergent/discriminant validity, which are addressed in this section.

#### **3.1 Instrument administration**

This stage of scale development, according to Hinkin (1998:105), measures the construct under examination. For this purpose, an organisation, whose management expressed the need to determine the engagement levels of their employees, and which allowed the researchers to use the data to validate the questionnaire, was used.

The staff/employees of this organisation reflected the profile of typical South African employees in terms of ethnic groupings, language, gender and educational level; as well as across occupations (unskilled such as farm workers, semi-skilled, such as factory workers, skilled, for example administration and sales staff, and professional, such as accountants and geneticists) and hierarchical levels (staff/employees, supervisory managers, middle managers, senior/executive managers).

The content of the questionnaire and the research procedure were agreed on with representatives from the organisation. As a first step, the questionnaire was pre-tested with a small number (10) of employees from different occupations and demographic profiles (educational qualifications, gender and language groups), who were subsequently excluded from the main study, to ensure that the participants understood the questions and were able to provide the information required. A few items were rephrased based on the feedback from the participants to ensure that these items would be understood by all participants. One item was dropped from the questionnaire.

These participants generally responded that the questionnaire was friendly and easy to respond to. (See results in table 1.)

**TABLE 1: Demographic profile of respondents (study 1 and study 2)**

Variables and categories		Study 1		Study 2	
Variable	Category	Frequency	%	Frequency	%
Gender	Male	211	52.9	542	50.5
	Female	183	45.9	527	49.1
	No response	5	1.2	4	.04
Years of service	0 to 1 year	47	11.8	54	5.0
	2 to 3 years	55	13.8	171	15.9
	4 to 5 years	55	13.8	149	13.9
	6 to 10 years	95	23.8	273	25.4
	10 years and longer	147	36.8	380	35.4
	No response	-	-	46	4.3
Age	Born between 1978 and 2000	122	30.6	366	34.1
	Born between 1965 and 1977	163	40.9	414	38.6
	Born between 1946 and 1964	113	28.3	287	26.7
	No response	1	0.2	6	0.6
Job grade	Top management	19	4.8	60	5.6
	Executive management	30	7.5	231	21.5
	Manager	128	32.1	304	28.3
	Supervisor	65	16.3	141	13.1
	Employee	156	39.1	335	31.2
	No response	1	0.2	2	0.2
Main industry	Energy and natural resources	-	-	86	8.0
	Financial services and insurance			159	14.8
	Government			71	6.6
	Information technology			89	8.3
	Manufacturing			139	13.0
	Retail and wholesale			98	9.1
	Services			100	9.3
	Tourism and leisure			54	5.0
	Other			155	14.4
	No response			122	11.4

Source: Calculated from survey results



A letter from the Human Resource Director describing the research project and its purpose was communicated to all employees, inviting them to participate in the study, clearly stating that participation in the study was voluntary, anonymous and confidential in order to comply with research ethics as well as to avoid social desirability in answering. Because subjective perceptions and experiences of individuals were required, the most appropriate method was self-reports (Conway & Lance 2010:329). A link to the questionnaire was sent to all employees with access to a computer. At the time of the study, the organisation in question employed 8 000 persons, country-wide, across occupations and hierarchies, of whom 3 000 had access to computers. The administration of the instrument complied with ethical requirements – the researchers obtained ethical clearance from their institution to conduct the study, while the participating organisation and individual participants consented to the study based on the disclosed purpose and principles of voluntary, anonymous and confidential participation.

In total, 399 employees participated in this (first) survey, exceeding the suggested norm of 150 for exploratory factor analysis and 200 for confirmatory factor analysis proposed by Hinkin (1998:111). In addition, the response rate exceeded the minimum norm of 5:1 proposed by Burns and Burns (2008:445). Thus the responses represented an adequate sample for further analyses. The demographic profile of respondents is illustrated in Table 1.

The sample of study 1 comprised 52.9% male and 45.9% female respondents. The largest generational group (40.9%) was born between 1965 and 1977. The variable on job grades showed that most respondents were employees/staff (39.1%) followed by managers (32.1%), from all business units, across the country. The respondents' years of service ranged from more than 10 years (36.8%) to less than a year (11.8%).

### **3.2 Initial item reduction**

The employee engagement scale was considered a newly developed one, hence exploratory factor analysis (EFA) was used to explore the factorial structure (Burns & Burns 2008:442; Costello & Osborne 2005; Osborne & Fitzpatrick 2012; Henson & Roberts 2006; Hinkin 1998).

Firstly, the authors performed a principal component analysis (PCA) on the (71) items to determine the number of factors to extract. They did this by investigating the eigenvalues,

scree plots and parallel analysis (Burns & Burns 2008; see Henson & Roberts 2006) outcomes conducted with R system package psych (Revelle 2014).

**TABLE 2: Factorability of the factor analysis**

Dimensions	Kaiser-Meyer Olkin	Bartlett's test of sphericity significance	Eigen values (Kaisers' criteria)	Scree plot	Final factor solution	% variance explained	$\infty$ Range	$\infty$
Organisational level (17)	0.945	0	2	2	2	56	0.931 - 0.935	0.935
Strategy and implementation (11)							0.900 - 0.918	0.915
Customer service (6)							0.792 - 0.830	0.841
Team level (12)	0.950	0	1	1	1	63	0.939 - 0.945	0.947
Immediate manager (7)	0.901	0	1	1	1	69	0.907 - 0.923	0.925
Individual level (15)	0.951	0	2	2	2	67	0.944 - 0.949	0.951
Organisational satisfaction (9)							0.925 - 0.938	0.936
Organisational commitment (6)							0.861 - 0.877	0.895

Note: () number of items

Source: Calculated from survey results

Various factor rotation methods were tested to determine the best fit. The Principal Axis Factoring (PAF) with oblique method yielded the best results. Before performing the PAF analyses, the authors assessed the suitability of the data for factor analysis by inspecting the Kaiser-Meyer-Olkin values and the Bartlett's Test of Sphericity (Burns & Burns 2008).

The Kaiser-Meyer-Olkin values for all the scales were acceptable and the Bartlett's Test of Sphericity was significant in all instances as reflected in Table 2. This confirmed that the

authors could perform exploratory factor analyses on the various data sets.

Depending on the suggestions from the three indicators (eigenvalues, scree plot and parallel analysis), the authors examined one-, two-, three-, four-, five- or six-factor solutions for the various scales.

Consequently, they used the factor solution that seemed to be theoretically and psychometrically the most sound in each instance. The results of the factor analysis are reflected in Table 3.

**TABLE 3: Factor analysis**

First-level factor analysis			Second-level factor analysis				
Item	Factor loading	Reliability	Item	Factor loadings		Construct reliability	
				Sub-factors		Sub-factors	
Factor 1				1	2	1	2
Q40	0.698	0.935	Q40	0.896		0.915	0.841
Q31	0.680		Q31	0.726			
Q75	0.636		Q75	0.521			
Q61	0.597		Q61		0.899		
Q60	0.594		Q60		0.633		
Q38	0.589		Q38	0.853			
Q39	0.561		Q39	0.867			
Q41	0.542		Q41	0.712			
Q32	0.539		Q32	0.552			
Q47	0.510		Q47		0.712		
Q37	0.483		Q37	0.666			
Q77	0.478		Q77		0.544		
Q78	0.456		Q78		0.564		
Q44	0.433		Q44	0.610			

Q30	0.431		Q30	0.605			
Q45	0.407		Q45		0.479		
Q35	0.401		Q35	0.598			
<b>Factor 2</b>							
Q55	0.853	0.947					0.947
Q56	0.834						
Q53	0.795						
Q52	0.773						
Q54	0.771						
Q57	0.763						
Q71	0.698						
Q51	0.682						
Q50	0.640						
Q69	0.601						
Q73	0.601						
Q76	0.472						
<b>Factor 3</b>							
Q65	-0.909	0.925					0.925
Q62	-0.877						
Q63	-0.832						
Q64	-0.754						
Q74	-0.691						
Q79	-0.664						
Q66	-0.637						
Q80	-0.479						

Factor 4							
Q12	-0.875	0.951	Q12	0.814		0.936	0.895
Q11	-0.837		Q11	0.960			
Q25	-0.811		Q25	0.779			
Q10	-0.706		Q10	0.885			
Q13	-0.746		Q13	0.752			
Q 9	-0.657		Q 9	0.781			
Q15	-0.628		Q15		0.660		
Q33	-0.626		Q33	0.558			
Q43	-0.587		Q43	0.682			
Q17	-0.560		Q17		0.923		
Q18	-0.599		Q18		0.797		
Q16	-0.470		Q16		0.793		
Q21	-0.436		Q21		0.545		
Q20	-0.403		Q20		0.650		
Q49	-0.402		Q49	0.431			

**Source:** Calculated from survey results

The first PAF yielded four factors. Only items with communalities above 0.20 (Costello & Osborne 2005) were included and a cut-off of 0.40 was used for the factor loadings cut-off (Costello & Osborne 2005; Netemeyer *et al.* 2003). According to Hair *et al.* (2010:118) loadings of  $\pm 0.30$  and  $\pm 0.40$  are minimally acceptable, while values greater than  $\pm 0.50$  are generally considered for practical significance. It was then decided to run a second order factor analysis for all four factors. Only factors 2 and 4 converged into two factors each (see Table 3).

Subsequently, the reliability analysis was calculated for all dimensions and sub-dimensions (see Table 3). All yielded adequate Cronbach's alpha values between 0.895 and 0.951. Hair *et al.* (2010:125) and Nunnally (1978:245) recommended minimum cut-off of 0.70.

This scale can be considered as solid as the six factors each consist of five or more items (see Costello & Osborne 2005; Henson & Roberts, 2006) (see Table 3). This is an indicator of convergent validity indicating that the dimensions measure consistently and represent the construct of employee engagement. The convergent validity of the constructs is also confirmed by the factor loadings of the dimensions all being above .40 (Hair *et al.* 2010:709).

### 3.2 Confirmatory factor analysis

After EFA, only 42 of the 71 items were retained and the adapted questionnaire was subsequently used in Study 2 to confirm the validity using a broader sample across organisations and industries. The database of a research company, which is made up of 285 000 business people from various industries reflecting the profile of the South African working population, was used in this study.

The database is permission meaning everybody in the database gave permission that they were willing to participate in online surveys. Hence, convenience sampling – which involves choosing the sample according to the availability of the researcher – was used again (Leedy & Ormond 2005, cited in Hayward 2006). Convenience sampling is criticised for its potential to be biased. However, the respondents reflected the typical population under study and are thus considered to be appropriate for purposes of this study (see Bono & McNamara 2011).

Only electronic surveys were used by means of mass e-mail invitation over a period of three weeks. Each potential respondent received a personalised e-mail, stating the purpose of the investigation and inviting them to participate in the survey on a voluntary, confidential and anonymous basis. In addition the ethical clearance for this project was also obtained from the university in question. The aim was to receive at least 1 000 completed questionnaires.

A total of 1 073 completed questionnaires were received. The demographic profile of respondents is reflected in Table 1. The sample comprised 50.5% male and 49.5% female respondents, while the largest generational group (38.6%) was born between 1965 and 1977. The variable on job grades showed that most respondents were employees/staff (31.2%) followed by managers (28.35%).

Respondents were from all industries with the majority (14.8%) from financial services and insurance followed by “other” (14.4%), then manufacturing (13.0%), services (9.3%), retail and wholesale (9.1%) and Government (6.6%). The respondents’ years of service ranged

from more than 10 years (34.4%) to less than a year (5.0%). Similar biographical trends were thus observed for the two survey sample groups.

To confirm the validity of the questionnaire, confirmatory factor analysis (CFA) in Structural Equation Modelling was applied. The purpose of the CFA was to test how well the measured variables represent a smaller number of constructs (Hair *et al.* 2010:693)

Although the CFA is quite similar to EFA in some respects, philosophically it is quite different. According to Hair *et al.* (2010:693) in EFA the researcher allows the statistical method to determine the number factor and loadings while in CFA the researcher must specify both the number of factors that exist for a set of variables and which factor each variable will load on before the results can be computed. The CFA is thus used to provide a confirmatory test of the exploratory factor analysis previously done. The results of the goodness-of-fit (GOF) indices are portrayed in Table 4.

The results indicate that all the indices are better model fits for the six-factor model, with all the indices close to 0.900. The only index which is slightly lower for the six-factor model is the parsimonious fit index (PFI), but it is still above 0.900. The Root Mean Square Error of Approximation (RMSEA) index is 0.060 for the six-factor model which indicates a good fit for samples of more than 300 respondents (Hair *et al.* 2010:672).

According to Hu and Bentler (1999:1) the RMSEA ranges from 0 to 1, with smaller values indicating better model fit, and a value of 0.06 or less being indicative of acceptable model fit. The RMSEA being 0.06 for the six-factor model can be considered an adequate fit, thus portraying better fit indices than the four-factor model. The Chi-square (CMIN) of 5836.966 with 1217 degrees of freedom,  $p=0$  level, was obtained. As the Chi-square test assesses the difference between observed and expected covariance matrices, the smaller the difference the better the model fit (Gatignon 2010). However, as the sample size increases, so does the statistical power of the chi-square, even if the matrices are practically identical (Hair *et al.* 2010:670).

The Chi-square value obtained for the measurement model of first order latent variables thus does not indicate a good model fit (GOF), but the size of the sample (average  $n = 1017$ ) reduces the meaningfulness of this GOF index (Gatignon 2010). For this reason, numerous authors disregard the Chi-square index for samples larger than 200, suggesting the use of

other GOF indices to determine GOF (Gatignon 2010; Hair *et al.* 2010:670; Hooper *et al.* 2008).

**TABLE 4: Goodness-of-fit indices for the six factor and four factor models**

Indices	6 Factor model	4 Factor model	Acceptable level
<b>Absolute fit indices</b>			
Chi-square (CMIN)	5836.966	8601.627	Lowest CMIN value
Chi-square degrees of freedom (d)	1217	1222	
P-value	0.000	0.000	Significant
Goodness-of-fit index (GFI)	0.809	0.715	0 (no fit) to 1 (perfect fit)
Root mean square error of approximation (RMSEA)	0.060	0.075	≤ 0.60 for samples > 300
<b>Incremental fit indices</b>			
Normed fit index (NFI)	0.860	0.7950	0 (no fit) to 1 (perfect fit)
Tucker Lewis index (TLI)	0.882	0.8030	0 (no fit) to 1 (perfect fit)
Comparative fit index (CFI)	0.886	0.818	>0.90
<b>Parsimony fit indices</b>			
Parsimonious fit index (PFI)	0.918	0.9220	0 (no fit) to 1 (perfect fit)

Source: Calculated from survey results

Hair *et al.* (2010:670) propose that multiple indices should be used to assess a model's goodness-of-fit. They furthermore propose the Chi-square, one absolute fit index, one incremental index and one badness-of-fit index.

The researchers used indices from each category as portrayed in Table 4 and came to the conclusion that the six-factor model should be accepted as the better model for the measurement of employee engagement.



**TABLE 5: Correlations**

		<b>Factor 1a Organisation strategy</b>	<b>Factor 1b Organisation customer service</b>	<b>Factor 2 Team</b>	<b>Factor 3 Immediate manager</b>	<b>Factor 4a Individual level satisfaction</b>	<b>Factor 4b Individual level commitment</b>
<b>Factor 1a organisation strategy</b>	Pearson correlation	1	0.752**	0.527**	0.686**	0.647**	0.787**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000
	N	1072	1072	1072	1072	1072	1071
<b>Factor 1b organisation customer service</b>	Pearson correlation	0.752**	1	0.607**	0.588**	0.594**	0.678**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000
	N	1072	1072	1072	1072	1072	1071
<b>Factor 2 team</b>	Pearson correlation	0.527**	0.607**	1	0.495**	0.547**	0.521**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000
	N	1072	1072	1072	1072	1072	1071
<b>Factor 3 immediate manager</b>	Pearson correlation	0.686**	0.588**	0.495**	1	0.549**	0.616**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000
	N	1072	1072	1072	1072	1072	1071
<b>Factor 4a individual level satisfaction</b>	Pearson correlation	0.647**	0.594**	0.547**	0.549**	1	0.710**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000
	N	1072	1072	1072	1072	1073	1072
<b>Factor 4b individual level commitment</b>	Pearson correlation	0.787**	0.678**	0.521**	0.616**	0.710**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
	N	1071	1071	1071	1071	1072	1072

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: Calculated from survey results

### 3.3 Convergent / discriminant validity

The convergent validity of the questionnaire pertaining to the factor loadings indicated that the high factor loadings in turn indicate that the factors converge on a common point, the latent construct (Hair *et al.* 2010:709). To further examine the discriminant validity, the correlation structure of the six dimensions was examined and are reflected in Table 5.

The results indicate, as expected, high correlations (above 0.70) between the dimensions of organisational strategy and customer and high correlations between the dimensions of individual level satisfaction and individual level commitment. The two dimensions of teamwork and immediate manager show the lowest correlations with the other dimensions (all below 0.70). These results confirm the discriminant validity of the dimensions. Individual level commitment shows a high correlation with organisational strategy. This can be expected as it is also expected that individual level commitment should have an influence on organisational strategy and vice versa. Therefore, the variables were distinct from one another.

To establish the convergent validity of the scales, we examined the average variances extracted (AVE). The AVE for strategy and implementation was 66%, for customer service the AVE was 64%, for team level the AVE was 71%, for the immediate manager AVE was 73%, for organisational satisfaction the AVE was 74% and for organisational commitment the AVE was 73%. The rule of thumb is that AVEs should be approximately 50% or higher (Hair *et al.* 2010:709). Hence, the findings showed that more variance is explained by the latent factor structure imposed on the measure, compared to the error that remains in the items. This supported the convergent validity of the measures.

## 4. LIMITATIONS AND PROPOSED FUTURE RESEARCH

The study was subject to limitations which need elaboration. The study required information on people's perceptions and experiences and hence the best way to collect data was considered to be self-report. However, self-report may be susceptible to common method variance. The anonymity of responses could counter this limitation. The convenience sampling may impact adversely on the potential to generalise the findings of this study. However, the respondents reflected the typical profile of South African employees, the population the instrument is designed for. Hence, the sample is considered appropriate for

the purposes of this study (see Bono & McNamara 2010).

This study was cross-sectional in nature and thus collected data at only one point in time. The researchers would however like to further improve the goodness-of-fit indices. One of the limitations of the second survey is that the assumption is made that the employee engagement questionnaire statements are perceived in the same way by the various biographical groups. It is interesting to note that most of the validity and reliability studies on employee surveys generally refer to the validity and reliability of the instrument for the total population participating in the particular survey(s). In a multicultural country such as South Africa, with its numerous language and ethnic groups, it is necessary to take differences into account in order to conduct fair assessments (Moerdyk & Van Aardt 2003:141).

In substantive research focusing on multigroup comparisons, it is typically assumed that the instrument of measurement operates in exactly the same way and that the underlying construct being measured has the same theoretical structure for each group under investigation. As evidenced in reviews of the literature, however, these two critical assumptions are rarely if ever tested statistically (Byrne 2004:272).

The next phase of analysis would focus on invariance testing among the demographical groups. A second limitation of the second survey was the large percentage of respondents who did not indicate their main industry. It is thus proposed that the next survey should include a more comprehensive main industry classification.

## 5. CONCLUSION

The purpose of this study was to validate the engagement scale developed for a diverse, multi-cultural environment (South Africa) building on existing research. Theoretically, engagement is a multi-dimensional, multi-level construct, which was confirmed by the analyses. The current scale, based on instruments adapted from previous research, provides evidence of construct validity. As such, this measure can be considered founded on a sound theoretical and empirical base and thus addressing the concern raised by Guest (2014) and Saks (2006).

Moreover, employee engagement, according to the results, matters on the organisational, team and individual levels and thus takes care of the concern raised by authors like Fearon *et al.* (2013), Guest (2014), Pugh and Dietz (2008) and Truss *et al.* (2013) and hence

contribute to closing the micro-macro divide. In addition, the measurement model suggests that engagement, as conceptualised in this study, is a multi-dimensional construct, which is congruent with previous literature in this regard (Frese 2008; Guest 2014; Fearon *et al.* 2013; Gruman & Saks 2011; Harter *et al.* 2002; Kahn 1990; Lockwood 2007; Macey & Schneider 2008; Masson *et al.* 2008; May *et al.* 2004; Mills *et al.* 2012; Parker & Griffin 2011; Robertson & Cooper 2010; Rich *et al.* 2010; Saks 2006, 2008; Schaufeli *et al.* 2002; Schaufeli *et al.* 2006; Seppälä *et al.* 2009; Shuck & Reio 2011; Truss *et al.* 2013; Van Rooy *et al.* 2011).

Moreover, all six factors (strategy and implementation; customer service; team level; immediate manager; organisational satisfaction; organisational commitment) contribute to the overall construct of employee engagement as defined in this study. The results also show evidence of the internal consistency of the components/dimensions. Consequently the measurement instrument can be considered rigorous.

The results of the first and second sample analysis indicate that researchers can use the questionnaire with confidence for future research. Both the factor analysis and the CFA confirmed the validity, reliability and CFA statistics explain that the theoretical specification of the factors matches the construct of employee engagement adequately.

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